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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,276	11/17/2003	Zhaohui Sun	87017DMW	4596

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EXAMINER	
SUN, XIUQIN	
ART UNIT	**PAPER NUMBER**
2863	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/715,276	SUN ET AL.	
	Examiner	Art Unit	
	Xiuqin Sun	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/12/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1-11 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Independent claims 1 and 10 are directed to an algorithm for determining the noise level of an input video sequence. The claims do not produce any tangible results. The practical application of the claimed invention cannot be realized until the output is conveyed to the user. For the result to be tangible it would need to output to a user or displayed to a user or stored for later use. Hence the claims are treated as non-statutory subject matter (See MPEP Sec. 2106). Claims 2-9 and 11 are rejected under 35 U.S.C. 101 base on dependency.

To view the new guidelines for 35 U.S.C. 101 please view the following OG notice: http://www.uspto.gov/web/offices/com/sol/og/2005/week47/patgupa.htm

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent

granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 4, 5, 7 and 9-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Allouche (U.S. Pub. No. 20040086194).

With respect to claim 1:

Allouche teaches a method for determining the noise level of an input video sequence corrupted by unknown noise (Abstract), said method comprising the steps of: (a) spatiotemporally filtering the input video sequence, thereby producing a filtered video sequence (Fig. 1; section 0002, 0028, 0030 and 0035); (b) estimating a standard deviation from the difference between the input video sequence and the filtered video sequence, thereby producing an estimated standard deviation (section 0028, lines 6-8; section 0029, lines 16-22); and (c) iterating through steps (a) and (b) using the estimated standard deviation previously obtained from step (b) to perform the filtering in step (a) until the value of the noise level approaches the unknown noise of the input video sequence, whereby the noise level is then characterized by a finally determined standard deviation (Fig. 1; section 0028, lines 6-8; section 0029, line 1 and lines 16-22; sections 0057-0058).

With respect to claim 4:

The teaching of Allouche further includes: wherein step (a) employs motion estimation and compensation to establish temporal trajectories of moving points and enhance temporal correlation between points across frames (section 0028).

With respect to claim 5:

The teaching of Allouche further includes: said spatiotemporal filtering of step (a) reduces random noise independent of video structure (sections 0057-0059).

With respect to claim 7:

The teaching of Allouche further includes: wherein the finally determined standard deviation corresponding to the noise level is used to reduce noise in the input video sequence through spatiotemporal filtering (Fig. 1; section 0028, lines 6-8; section 0029, line 1 and lines 16-22; sections 0057-0058).

With respect to claim 9:

The teaching of Allouche further includes: a computer storage medium having instructions stored therein for causing a computer to perform the method of claim 1 (section 0018).

With respect to claim 10:

Allouche teaches a system for determining the noise level of an input video sequence corrupted by unknown noise (Abstract), said system comprising: a spatiotemporal filtering module for processing the input video sequence, thereby producing a filtered video sequence (Fig. 1; section 0002, 0028, 0030 and 0035); a noise estimation module for estimating a standard deviation from the difference between the input video sequence and the filtered video signal, thereby producing an estimated standard deviation (section 0028, lines 6-8; section 0029, lines 16-22); and means interconnecting the filter and the noise estimation module for iterating through the modules using the estimated standard deviation previously obtained from the noise

estimation module to perform the filtering in the spatiotemporal filtering module until the value of the noise level approaches the unknown noise, whereby the noise level is then characterized by a finally determined standard deviation (Fig. 1; section 0028, lines 6-8; section 0029, line 1 and lines 16-22; sections 0057-0058).

With respect to claim 11:

The teaching of Allouche further includes: a spatiotemporal filter for reducing noise in an input video sequence without using a reference video indicative of a ground truth value (Fig. 1; sections 0002 and 0028), wherein the spatiotemporal filter uses the finally determined standard deviation produced by the system of claim 10 (Fig. 1; section 0028, lines 6-8; section 0029, line 1 and lines 16-22; sections 0057-0058).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 2, 3, 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allouche in view of Hazra et al. (U.S. Pat. No. 6353680).

With respect to claims 2 and 3:

Allouche teaches the method including the subject matter discussed above except: the iterations in step (c) are carried out until the change in estimated noise level

is less than a predetermined threshold; and the iterations in step (c) are carried out until a predetermined number of iterations has been reached.

Hazra et al. teach a method and apparatus for image processing, including an iterative processing filter, wherein the iterations are carried out until the change in estimated noise level is less than a predetermined threshold; and wherein the iterations are carried out until a predetermined number of iterations has been reached (cols. 1-2, lines 56-3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Hazra et al. in the invention of Allouche in order to provide a simple and effective mechanism of controlling the iteration of the iterative processing filter (Hazra et al., cols. 1-2, lines 56-3).

With respect to claim 6:

The teaching of Allouche further includes: wherein a fast median estimation method is employed for efficient computation (section 0041).

With respect to claim 8:

Allouche teaches the method including the subject matter discussed above except: wherein the finally determined standard deviation corresponding to the noise level is used to evaluate video quality without using a reference video input corresponding to a ground truth value.

Hazra et al. teach a method and apparatus for image processing, including an iterative processing filter, wherein a finally determined standard deviation corresponding to the noise level of an input video sequence is used to evaluate video quality without

using a reference video input corresponding to a ground truth value (cols. 1-2, lines 56-3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Hazra et al. in the invention of Allouche in order to provide a simple and effective mechanism of controlling the iteration of the iterative processing filter (Hazra et al., cols. 1-2, lines 56-3).

Prior Art Citations

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1) Le Clerc (U. S. Pat. No. 6307888) is entitled "Method for estimating the noise level in a video sequence".

2) Florent et al. (U. S. Pat. No. 5671264) is entitled "Method for the spatial filtering of the noise in a digital image, and device for carrying out the method".

3) Dinh et al. (U. S. Pat. No. 6633683) is entitled "Apparatus and method for adaptively reducing noise in a noisy input image signal".

Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiuqin Sun whose telephone number is (571)272-2280. The examiner can normally be reached on 6:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571)272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

XS
March 1, 2007

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